2015 MISM Capstone Projects

Presentation Schedule and Descriptions
## MISM Capstone Presentation Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Title/Presenters</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, April 3</td>
<td>4:00 PM</td>
<td>BasicSecure&lt;br&gt;Grant Peterson, Brock Walters</td>
<td>TNRB 674</td>
</tr>
<tr>
<td>Tuesday, April 7</td>
<td>8:00 AM</td>
<td>Hinckley Visitor’s Center Kiosk Redesign&lt;br&gt;Joshua Bohling</td>
<td>TNRB 710</td>
</tr>
<tr>
<td></td>
<td>8:30 AM</td>
<td>Story Branches&lt;br&gt;Scott Hutchings</td>
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<tr>
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<td>Learning Math the Right Way&lt;br&gt;Brooke Frandsen, Anthony Frehner</td>
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<tr>
<td></td>
<td>10:00 AM</td>
<td>bettrnet.com&lt;br&gt;Rope Leonard, Colton Shields, Troy Shields</td>
<td>TNRB 710</td>
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<tr>
<td></td>
<td>12:30 PM</td>
<td>Pedigreeable&lt;br&gt;Matt Swensen</td>
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<td>FasTrack&lt;br&gt;Joseph Burwasser, Xavi Sio</td>
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<tr>
<td></td>
<td>2:00 PM</td>
<td>Brevium, Inc. Sales Dashboard&lt;br&gt;Jake Bengtson, Roy Matsunaga, Scott Sefcik</td>
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<tr>
<td></td>
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<td></td>
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<td>Time Tracking Api, Web App and iOS App&lt;br&gt;Garett Breen</td>
<td>TNRB 710</td>
</tr>
<tr>
<td>Wednesday, April 8</td>
<td>8:00 AM</td>
<td>Event Day Parking&lt;br&gt;Blake Entrekin</td>
<td>TNRB W352</td>
</tr>
<tr>
<td></td>
<td>8:30 AM</td>
<td>Implementation of SCCM - an IT Asset Management System&lt;br&gt;Phong Le</td>
<td>TNRB W352</td>
</tr>
<tr>
<td></td>
<td>9:00 AM</td>
<td>Timesheet for Android&lt;br&gt;Daniel George</td>
<td>TNRB W352</td>
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<tr>
<td></td>
<td>9:30 AM</td>
<td>Rise of Heroes&lt;br&gt;Phil Bobo</td>
<td>TNRB W352</td>
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<tr>
<td></td>
<td>10:00 AM</td>
<td>Polynesian Cultural Center iOS App&lt;br&gt;Mark Laney, Alex Murray</td>
<td>TNRB W352</td>
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<tr>
<td>Time</td>
<td>Title</td>
<td>Name(s)</td>
<td>Room</td>
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<tr>
<td>10:30 AM</td>
<td>The Missing Link: Advanced Database Class</td>
<td>Tanner Pratt</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Survive or Thrive - Unity Game Development</td>
<td>Derek Peck</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>Project Management Software (&quot;Procademy&quot;)</td>
<td>Sean Fisher, Sean Thornton, Morgan Young</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Project Narrative: Approaching Narrative Therapy Through Social Media</td>
<td>Brian Farnsworth, Matthew Sheets</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>12:30 PM</td>
<td>Profanity Filter for Consoles</td>
<td>Roy Hemmert</td>
<td>TNRB W352</td>
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<tr>
<td>1:00 PM</td>
<td>TeamStorm</td>
<td>Tommy Groshong</td>
<td>TNRB W352</td>
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<tr>
<td>1:30 PM</td>
<td>Smash Vid</td>
<td>Ryan Craig</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Kyazma Knowledge Repository</td>
<td>Chandler Egbert, Nicholas Mortensen</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>BYU IS News</td>
<td>Steven Angus, Laura Cutler</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>FillStat + PumpPal</td>
<td>James Hendricks</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>Blender Bottle Analytics</td>
<td>Brent Anderson, Matt Winn</td>
<td>TNRB W352</td>
</tr>
<tr>
<td>4:00 PM</td>
<td>CyberIQ</td>
<td>Hilary Hayes, Maria Yacaman</td>
<td>TNRB W352</td>
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Project Descriptions
### Thursday, April 3

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Executive Summary

The world is in a constant state of technological evolution. As new technologies push the boundaries of possibilities many people are getting left behind in their knowledge and understanding. Every day a new smartphone is coming out, a new tablet, a new operating system and each rendition is different. Every new piece of technology has a learning curve and one area that many have fallen behind the curve is basic computer security.

Over the past several years Grant and I have been the go-to-guys for our home town’s technology needs. When either of us would go home to visit family and friends there were those that would come to us and ask for help. The problems ranged from setting up routers, reformating computers due to viruses and a myriad of inbetweens.

We thought about the constant fixing and breaking and knew that something needed to be done. BasicSecure is the answer. A simple completely automated, hardening suite designed for the common user. BasicSecure tears through and sets up a series of blockades so that it will be more difficult for the average user to get in as much trouble. This suite is currently fully functioning and is now available online free of charge.
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MISM Capstone Project
Hinckley Center Kiosks

Name(s): Joshua Bohling
Faculty Mentor: Stephen Liddle

Executive Summary

The BYU Visitor’s Center housed in the Gordon B. Hinckley building features 8 touchscreen kiosks with interactive content. The original kiosk content and interface were created when the building was completed in 2007 and have not been updated since. The interface, content, and infrastructure of the Visitor’s Center kiosks had served the university well for the past 8 years, but new technologies and design principles, along with limitations inherent to the current system, necessitated a system redesign.

The system has been redesigned with a new technology stack. Content is being selected and upgraded to HD where possible and new content added where appropriate. The user interface has been radically updated to reflect the traditional feel of the Hinckley Center while adding modern enhancements and implementing solid UX principles; the overall user experience has been greatly improved. All content on the site is database driven, making changes and additions much simpler than with the previous system. A dashboard has been created to allow for the generation of reports and the preview of on-kiosk content.

This project is a modern web project, built on core web technologies including CSS3, HTML5, and JavaScript. Adobe’s ColdFusion server-side language is used for database transactions and page generation. LESS—a CSS pre-processor—is used to enhance the capability and readability of CSS3. HTML5 video is used to imbed video into kiosk display pages. ColdFusion’s built-in implementation of WebSockets has been leveraged to enable two-way communication between dual-screen kiosks, which run on two separate PCs but appear as a single kiosk entity to the end user.

Kiosks use full-screen instances of a WebKit browser to display content pulled down from regal.byu.edu, the Hinckley Center’s dedicated kiosk web server. The user interface features a simple hierarchal information structure, with no content more than three clicks away from the main screen. The interface employs video attraction loops and intelligent time tracking to reduce screen image burn-in and prolong display life. The interface is beautiful, timeless, and easily understood by users. Relevant information is displayed in conjunction with video clips to enhance the learning experience.

This project has greatly enhanced the value of the Visitor’s Center to campus guests by providing modern, relevant content that enriches visitors’ understanding of BYU’s missions, achievements, and programs. Using custom analytics, Visitor’s Center administrators and committee members are given feedback on which content is popular and can make informed decisions about the selection of new content for display on kiosks. The stability of UNIX has been brought to the kiosk clients, greatly improving system uptime and long-term dependability. In short, this visual and technological update has created a more stable and attractive kiosk system, one that is capable of being adapted and used for many years to come.
Executive Summary

Most people who have read any work of fiction have had at one point or another an idea for their own work of fiction. Some of these people may have actually started writing their work of fiction thinking that they might become an author one day. Unfortunately very few finish their work and even fewer get published.

Another pitfall that comes with those who want to write fiction is the fact that only one author writes the story. That means only one perspective goes into the making of a story. The saying “two heads are better than one” is rarely exercised in creative writing.

Also, there isn’t a decent place where prospective writers can post their ideas and drafts. Nor is there a good place for these prospective writers to receive feedback on their ideas in progress.

My project is a responsive HTML5 web application that brings prospective writers together. This application allows users to start works of fiction and to then share these works with others. Works of fiction can be collaborated with friends and other writers so that multiple people can contribute to writing and editing the story. Owners of the works of fiction will have complete control of their works and can grant permissions to specific people. Some of these permissions could be editing versus contribute-only rights or reading versus commenting rights etc. This application is also the central location for keeping drafts and notes on writers’ works.

This system also includes a library of posted or finished works of fiction; allowing users to read other works and provide feedback. Users can search and sort the finished works by topic, genre, and type of work (poem, short story, novel etc.). This system could, in the future, allow publishers to find works of fiction worth purchasing and the funds could be distributed among all contributors of the work.

Another focus of this system is the ability to branch a story, effectively making it simple to create Choose Your Own Adventure stories.

This application uses the Model View Controller pattern based off of the Ruby on Rails framework. Other technologies include Bootstrap SASS to tie the views together and PostgreSQL to persist the data. Rails is perfect for this application, allowing me to quickly and easily adapt the data model and application when needed.
MISM Capstone Project
Learning Math the Right Way

Name(s): Anthony Frehner, Brooke Frandsen
Faculty Mentor: Steve Liddle

Executive Summary

For many people, math is an incredibly difficult topic to learn because of all the rules, exceptions to the rules, and exceptions to the exceptions. A system has been developed by Anthony’s father Alfred a high school teacher of over 25 years that distills the basic math operations (addition, subtraction, division, multiplication) down to simple and basic rules that are the same no matter if you are working with fractions, integers, variables, or anything else. The content and the ideas are completely developed and need a system to deliver the content and lessons.

Proposed Solution/Approach

We will build a web-based system that will securely track and monitor progress of students as they progress through various lessons that teach them these universal rules of math. There will be a way for a parent or teacher to see a student’s progress and also see areas in which the student has struggled or needs help, which allows the parent/teacher to tailor their personal teaching time to meet those needs.

High-Level Design

Heroku will be the platform on which the application is built and deployed. This platform as a service will allow us to easily push code with Git and get it running quickly. Our backend will be running NodeJS with a SailsJS framework, and our frontend will be built using AngularJS. We will use a RESTful API backend so that it will be easy to expand to other devices such as mobile phones without need to make changes to the backend. We will follow best practices in regards to security, authorization, authentication, testing, design, and layout.
Executive Summary

bettrnet.com

There exist many solutions to aid parents in monitoring and filtering content that is consumed on desktop computers. It is no surprise that the media consumption behavior of the world is shifting more and more to our smart devices. Mobile monitoring and filtering offerings for parents are few and limited in their effectiveness. Our project aims to change the world and make that situation bettr. [did you see what I did there?]

Few parents fail to acknowledge the direct influence that media consumption has on their children’s behavior. It goes without saying that the types of media an individual consumes impacts attitudes, opinions, standards of socially acceptable ideas, and the very foundational frameworks we use to evaluate the world around us. The old adage “you are what you eat” is absolutely true in a broader sense: Society is what collectively it chooses to consume.

Involvement in a child’s internet behavior, enables parents to have a more meaningful impact in that child’s development. Bettrnet strengthens relationships between children and parents by delivering awareness and providing creative tools of involvement.

Leveraging the built in capabilities of smart devices we repurpose a feature that historically has only been leveraged by large enterprises. This new application of mature and well tested HTTP Proxy technology provides parents a bettr way to monitor and engage children on their mobile devices. It connects parents to their children’s increasingly digital life. Basic filtering, custom reporting, realtime alerts and dynamic policies enable parents to have more influence and an awareness that even the NSA will be jealous of. Our bettr mobile device platform holds potential to abstract out a child’s time in front of the screen and utilize it in a token reward system.

We are serious about changing the world through means of the world wide web. This capstone project is much more than a school assignment. Ultimately we will reinforce family culture as defined by the parent and bring down the barriers for nontechnical parents and enable them to be on top of managing the media consumption behavior of their family.
Pedigreeable

Name(s): Matt Swensen
Faculty Mentor: Conan Albrecht

Executive Summary

Some months ago, my wife found a website that made available for purchase hand-made pedigree charts. The charts were suitable for home décor and, in our case, made for a perfect gift for a family member’s baby shower. Unfortunately, the process of ordering the charts from this particular site was cumbersome (manually emailing names to the designer and waiting 5-7 days) and expensive ($45.00 for a digital file with no option to order physical prints). Since the design was relatively simple, I created a similar chart in Adobe Illustrator for our gift instead of ordering one from the site. We then realized that there was an opportunity to automate the process and offer a higher-quality, lower-priced online service for creating designer pedigree charts.

Pedigreeable is a web application that allows customers to choose templates, choose color schemes, and interactively provide the data necessary to generate beautiful pedigree charts without the need of a professional designer. Users are able to download low-resolution versions of their charts for free, or pay for high-resolution versions for printing. There is also a third pricing tier for ordering physical prints that are shipped to their door.

The technology stack is as follows:

<table>
<thead>
<tr>
<th>Technology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td></td>
</tr>
<tr>
<td>Scala (SBT / Play)</td>
<td>Primary server-side language</td>
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<tr>
<td>SVG</td>
<td>Image format for the pedigree charts</td>
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<tr>
<td>JavaScript (Backbone.js)</td>
<td>Primary client-side language</td>
</tr>
<tr>
<td>CSS (Sass)</td>
<td>UI</td>
</tr>
<tr>
<td>HTML</td>
<td>UI</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
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</tr>
<tr>
<td>Nginx</td>
<td>SSL and load balancing</td>
</tr>
<tr>
<td>PhantomJS</td>
<td>Rendering the SVG images on the server and sending PNG data to the client</td>
</tr>
<tr>
<td>DigitalOcean</td>
<td>Cloud hosting service</td>
</tr>
<tr>
<td>MongoDB</td>
<td>Data storage</td>
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<tr>
<td><strong>Business</strong></td>
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</tr>
<tr>
<td>Google Analytics</td>
<td>Business intelligence surrounding interactions, payments, etc.</td>
</tr>
<tr>
<td>Stripe</td>
<td>Payment processing</td>
</tr>
<tr>
<td>Lob</td>
<td>Automated printing and mailing service</td>
</tr>
</tbody>
</table>
MISM Capstone Project
ToQuit Smoking Cessation App

**Name(s):** Grant Buehner  
**Faculty Mentor:** Dr. Stephen Liddle

**Executive Summary**

The Utah County Health Department has used a number of programs over the past few years to help pregnant women quit smoking. One of the most successful programs has been one created by the Health Department, called BabySteps. The BabySteps program consists of a workbook women use to learn about how to quit and to track their progress. The program tries to get them to quit smoking within 10 days and to stay clean for up to a year after the baby is due. The program motivates women to quit by giving them free diaper coupons that can be redeemed at local stores if they can pass a smoking breath or saliva test.

One of the main problems the county has had to deal with is after giving material and information to the women they sometimes don’t hear from the women for long lengths of time, making it hard to know how well the women are following the quit program. This can be dangerous because if the women don’t end up quitting they are 20%-30% more likely to have a low-birth weight baby, and smoking results in 14% of preterm deliveries and 10% of infant deaths.

To solve this problem I’ve worked on creating an iPhone app for women to report their progress on quitting and a website the program directors can log into to see how these women are doing. The app allows women to sign in anytime to report how many cigarettes they have smoked since the last time they signed in. The women will be able to track their progress to see details of how many cigarettes to reduce using each day to quit within ten days, how many days they’ve been clean, how much money they’ve saved, etc.

The program directors can log in and see live, up-to-date data of how their patients are doing. The directors also have the ability to add videos and facts for people in their program to see. The app will track who has watched which videos. That way the directors can see who is getting educated and who may need help learning about how to quit smoking. The facts the directors enter will be displayed one at a time whenever the app user reports how they are doing. Again, this will help educate the women.

BabySteps has been trying to not only help mothers to quit smoking, but fathers as well, as any second hand smoke in the home can be also potentially dangerous to infants. Because of this the website allows the directors to put in specifications as to which audience gets which videos or facts. For example, expecting mothers or recent mothers may get all the videos about how to quit, but they will also get videos about how quitting will help their baby, whereas a standard app user will only get videos about how to quit smoking.

The website was created using Ruby on Rails. It has a PostgreSQL database and is hosted on Heroku. The iPhone app was programmed in Swift.
Executive Summary

Problem

The college recruiting process for high school track athletes currently only favors the 99th percentile. The majority of students and colleges alike are unaware of recruiting opportunities on a national level due to physical restrictions of distance. The paradigm dictates that most athletes only have scholastic opportunities with schools which are proximal to where they live. These students disregard schools which are far away and do not solicit them. However, there are numerous athletes who would qualify for many colleges if these athletes had exposure and were aware of these opportunities.

Solution

Our objective with FasTrack is to create a social networking site, similar to LinkedIn, where coaches and athletes can connect and engage in the recruiting process. FasTrack will eliminate distance barriers and aid athletes and colleges in identifying and selecting their finest opportunities. Our goal is to get colleges in the state of Utah to use it in the near future.

Technologies

We utilized the following technological components in our project:

- Node JavaScript - Server-side runtime environment used to communicate with the database.
- MongoDB - MongoDB will store the athletes’ and coaches’ data.
- AngularJS - Frontend user interactions. AngularJS will be used to graphically display athletes’ data for college coaches.
- Express JavaScript - Web application framework which interacts with NodeJS
- Bootstrap - Bootstrap will be implemented and use its grid layout to facilitate and expedite the creation of the site’s theme and superficial layout.

Deliverable

The FasTrack site includes all of the essential functions for users. Students and coaches alike are able to create accounts, update and maintain their own information, and network with other users. Coaches have querying capabilities to filter through and identify potential athletes for their school. Athletes are able to search for schools that fit them best and then solicit them. Once mutual interest has been established between both a coach and a school, FasTrack also provides chat functionality to allow real-time communication between the users.
**Executive Summary**

Brevium, Inc. creates software that helps medical practices identify and contact patients who are due for a recall. This software integrates with medical practice management systems, generates lists of patients to contact, and displays information about those patients so that the practice's staff can make calls, set appointments, etc. The number of calls made by using Brevium has a significant impact on the profits of the medical practice, and on the success of Brevium as a company.

Upon conducting our initial observations and interviews with the president of the company, and various members of the sales team, we found that even though Brevium collects information about customer usage of the product, there was no reporting system to help the sales team identify trends in usage. Producing information about customer's history (calls made, revenues generated, etc.) was a manual, lengthy, and costly process.

Our analysis of the business and current data showed that the greatest value to the sales team would be created by an ability to segment customers based on their usage of Brevium. Being able to place customers in categories based on a variety of factors, sales team members could then drill down and view trends for specific customers. This would enable the sales team to identify and respond to customers in a timely manner.

In order to help the sales team realize this value, we created a reporting system using SQL Server Reporting Services that allows the sales team to: 1) view aggregated data about customer's usage of Brevium; 2) view information related to customer segments based on usage; and 3) drill down and view detailed performance/financial information about specific customers.

To create the reports, we needed to analyze the database where all of the sales-related data was gathered and stored, develop a model specifically for the sales reporting dashboard, prepare the data for analysis, analyze the data, and then produce the reports.

We have worked with the sales team and others at Brevium on a regular basis to create this reporting system, and will soon present our final product to the company.
MISM Capstone Project
Corporate Automated Attack Framework

Name(s): Nathan Cooper
Faculty Mentor: Anthony Vance

Executive Summary

Beyond accurate network diagrams, ingress filters, firewalls, and up-to-date software packages, the vast majority of companies house a critical vulnerability for which there is unfortunately no patch: their employees. Bruce Shneier, a world-renowned cyber security expert stated, “Only amateurs attack machines; professionals target people.”¹ When companies include “social engineering” and “client-side attacks” in the scope of their external penetration tests, the success rate is scary. However, current methods of addressing this vulnerability, such as frequent penetration tests, seminars, and trainings, are both ineffective and expensive. Furthermore, without frequent external penetration tests, businesses have an extremely difficult job in collecting relevant data on the cyber-security awareness of their human capital.

This project changes that.

The Corporate Automated Attack Framework (CAAF) will be an extensible, distributed system designed to perform common attacks on one’s own employees, and record the responses of the employees. User-centric and team-centric data of this nature could then be used to make informed business decisions, including the more targeted education and rewarding of employees. It also provides a much more accurate view of the general readiness of employees to withstand user-focused attacks.

The purpose of the framework is to maintain security awareness within an organization over time, while providing management with the appropriate statistics to measure policy effectiveness. Once the system was installed, a baseline could be taken of employee awareness. It is generally understood that positive reinforcement has the potential to be significantly longer-lasting in terms of behavioral change than negative reinforcement.² The impact a corporation could experience in terms of security would be huge if management were to publicly reward individuals for “good behavior” in the face of such an automated attack. Furthermore, management could allow teams to compete for behavioral stats in the face of attack attempts, with the winning team obtaining some coveted reward.

At a high level, the system will consist of a master-agent command network, with an administrative web interface. The master will have an understanding of user / group entities, the resources attached to those entities, and attack methodologies. It will then use this information to formulate attacks against select entities, focusing on the resources they use. The master will then issue commands to the slave agents, which will perform their various roles in the attack, based on the capabilities they report to the master.

For example, once in a network, a hackers may perform a Man in the Middle (MITM) attack on employees in order to siphon sensitive information including usernames and passwords. Modern web browsers will loudly complain in such an attack by displaying a large warning to the user. Unfortunately, current culture has trained (especially technical) users to ignore and click-through such warnings. Now, imagine this was a simulated attack by CAAF, and instead of clicking through warning, Bob reported the issue to IT. Next quarterly all-hands meeting, Bob is given a $20 Amazon gift certificate for avoiding a targeting attack. Gradually, employees will begin to see security-related warnings as a way to “gain points” or “win stuff”.

² AllPsych and Heffner Media Group, Inc. © 1999-2003 All Rights Reserved. Psychology101 (Chapter 4) http://allpsych.com/psychology101/reinforcement.html
MISM Capstone Project
Women in Information Systems: When Passion Becomes Your Career

Name(s): Tahna Black, Michelle Hill, Nina Lang
Faculty Mentor: Bonnie Anderson

Executive Summary

Forbes recently ranked information systems as the best master’s degree for jobs, citing an expected 30% increase in demand for IS positions. However, these and other impressive statistics do not define the passion women have for IS. Constantly-changing technologies, the ability to work from home, standing out in the business world, and feelings of empowerment, freedom, and leadership are among many explanations highlighting why female IS students are passionate about their field of study.

The mission of our capstone project is to raise awareness of the opportunities for women that come from joining the Information Systems (IS) program. Our hope is to eliminate stigmas, reduce the intimidation of pursuing a STEM degree, promote the importance of women in the workforce—particularly technology, and convince female students to study IS to ultimately increase the number of women in the major. We plan to do this by creating a pilot program at BYU to show the passionate women in IS/tech and how their degrees have shaped their careers. We hope other universities will find our pilot program useful in strengthening diversity in information systems and tech-related degrees.

The idea for the capstone project grew from question and unease for the low number of females currently enrolled in BYU’s Information Systems (IS) program. IS is one of the top ranked programs at BYU, but men have always far outnumbered the women in the major. What was the reason for this?

With diversity of talent and insightful ideas, our team has been able to reach out to women to show them the impact a female in IS can have in the world of business and technology. We have fulfilled our mission in the following ways:

- Interviews from past and current female IS students
- Presentations to ACC 200, IS 110/102, IS 201, IS 303, and Career Exploration classes
- Analytics gathered from survey data about the perspective of the program
- Female Freshman letters
- Volunteer work at SheTech Exploration Day and BYU Women in Business Major Shopping Event
- Campus-wide informational event sponsored by Kyazma Business Consulting and featuring speakers from the Six Sisters’ Stuff blog

We will create our pilot program based on our experiences implementing these initiatives to share with other universities and bring longevity to recruiting efforts at BYU.

We, Tahna, Michelle, and Nina, all love and are incredibly passionate about the information systems program! We hope to have given every woman the chance to learn its value and see the incredible opportunities IS can bring into one’s life...just like it has changed ours!
Executive Summary

For my capstone project I created a 2D SpriteKit platform game for the Apple iPad. My inspiration for this came from a game called Mine Trap that I used to play as a child on my fathers old DOS system. I enjoyed playing it so much that I would like to put my own spin on an old classic.

There are many drag and drop game making software tools on the market, however; I have a strong desire to develop my limited skill set in Swift, and in addition to that enter the video game space by learning this new SpriteKit technology.

Mobile gaming is a huge industry, and there is plenty of money to be made when putting a quality game on the market. There is always demand for fun phone and tablet games, therefore; my iPad game will be solving a business need that will likely never go away. Naturally within this industry there is the challenge of longevity; requiring me to make this game fun for all ages and categories, but also be constantly updating the game and keeping it modern. This game is primarily for the iPad, but perhaps a later release could see it becoming available for the iPhone, and even other platforms.
Executive Summary

The product I am building this semester is an app that will be used in my company for developers to log the time they worked each day. The user will be able to choose which client they are working for at the time, how long they worked, which subproject they worked on and give a description of the work that they did. They will also be able to choose the task that they are working on. This will be accomplished by the Time Tracker API interfacing with PivotalTracker, a project management site that the company uses to manage all their projects. Finally, there will be an admin area that admins can use to create, update, and delete users, jobs, and rates. Also part of the admin area will be some reporting pages that will show the time users have worked for each month and each user can be drilled down into to show the details of their time worked (which projects worked on for how long).

The problems that these steps address are the following:
1. The current time tracking web app we use is out dated and slow, so we want to update the technology
2. There is no API to allow for different front end integration
3. The managers currently have no way to easily figure out the end of the month totals to charge clients
4. The managers currently have no way to see employee hours worked in order to do payroll

Major components/technologies:
1. SqlServer
2. .Net WebApi
3. Entity Framework 6 Code First
4. Angular.js
5. Html markup
<table>
<thead>
<tr>
<th>Time</th>
<th>Title/Presenters</th>
<th>Room</th>
</tr>
</thead>
</table>
| 8:00 AM| Event Day Parking
Blake Entrekin                                                     | TNRB W352 |
| 8:30 AM| Implementation of SCCM - an IT Asset Management System
Phong Le                                                   | TNRB W352 |
| 9:00 AM| Timesheet for Android
Daniel George                                               | TNRB W352 |
| 9:30 AM| Rise of Heroes
Phil Bobo                                                    | TNRB W352 |
| 10:00 AM| Polynesian Cultural Center iOS App
Mark Laney, Alex Murray                                       | TNRB W352 |
| 10:30 AM| The Missing Link: Advanced Database Class
Tanner Pratt                                                 | TNRB W352 |
| 11:00 AM| Survive or Thrive - Unity Game Development
Derek Peck                                                  | TNRB W352 |
| 11:30 AM| Project Management Software ("Procademy")
Sean Fisher, Sean Thornton, Morgan Young                  | TNRB W352 |
| 12:00 PM| Project Narrative: Approaching Narrative Therapy Through Social Media
Brian Farnsworth, Matthew Sheets                            | TNRB W352 |
| 12:30 PM| Profanity Filter for Consoles
Roy Hemmert                                                 | TNRB W352 |
| 1:00 PM| TeamStorm
Tommy Groshong                                               | TNRB W352 |
| 1:30 PM| Smash Vid
Ryan Craig                                                  | TNRB W352 |
| 2:00 PM| Kyazma Knowledge Repository
Chandler Egbert, Nicholas Mortensen                          | TNRB W352 |
| 2:30 PM| BYU IS News
Steven Angus, Laura Cutler                                    | TNRB W352 |
| 3:00 PM| FillStat + PumpPal
James Hendricks                                              | TNRB W352 |
| 3:30 PM| Blender Bottle Analytics
Brent Anderson, Matt Winn                                     | TNRB W352 |
| 4:00 PM| CyberIQ
Hilary Hayes, Maria Yacaman                                   | TNRB W352 |
Executive Summary

I regularly attend sporting events and have witnessed how, at times, event goers have had to go to an event early in order to find parking spots. Those who don’t attend regularly stadium events also find themselves driving around stadiums struggling to find reasonable parking. As I pondered these problems, I marveled at how great it would be if technology could be introduced into this process to make this workflow more efficient and save time for the event goers while providing advertising and the ability to make more money for parking lot owners.

My capstone project is a web application that will streamline the event parking process. By leveraging Google Maps and crowd sourced information, the web application enables event goers to view potential lots prior to games, see the last known lot pricing, submit updated pricing information based upon their own experience, get directions to the lot prior to the game, and in the future reserve a parking spot. A comparable application would be “GasBuddy,” which uses crowd sourced information to display the cheapest gas prices in a given the area.

The front-end interface is coded using html, ajax, css, javascript, and php. The interface alsos leverage Google Maps for the location and driving directions. Several pages are available at launch that include viewing/searching for local Utah venues, viewing/searching for parking lots, registering as an event goer, and submitting lot information. The interface is also designed in a responsive way that allows for adaptation based on the device screen.
Executive Summary

For my capstone project, I have decided to work on something that is meaningful to the Information System program as a way to give back for what I have developed in the past five years at BYU. In addition, I am working for the Office of IT Field Service as a Development Technician which solves a wide range of complex problems and develops long-term solution for automation technology.

As a result, I decided to use System Center Configuration Management (SCCM) as a focus on my capstone project. Currently, I have been at the Field Services for more than two years and I found that the new hires often had hard time to catch up with technical concepts. The reason is the team doesn't have a standard procedure for training or onboarding process. As a result, the only way they can get experience is to learn by themselves or to be trained by current employees. However, current employees also don't have standard procedures to decide what to teach or how to teach it. As a result, I have decided to prepare some basic training tutorials including sample scripts and training video to help the new hires meet the minimum technical requirements to start on the job. Later on, they can build up their own experience, but the initial step is always the most important one.

Additionally, BYU Field Services has implemented SCCM starting the summer 2014. However, since the change, we have been restricted in term of customization on SCCM because another dedicated team already takes care of that. As a result, I will build up my capstone project to meaningfully support the Information System Lab by implementing SCCM and building up an image with Windows 8.1. Using SCCM is also a part of the original plan of Dr. Meservy to upgrade the IS Lab during summer 2015 as it will provide powerful technology to automate lab management process.

At this point and time, for my capstone project, I anticipate to deliver as follow:

- Training materials including documents and videos for OIT Field Servers which include:
  - Introduction to SCCM
  - Introduction to Windows directory hierarchy
  - Introduction to Windows batch scripting
  - Introduction to Windows Powershell scripting
- Implement SCCM for IS Lab
  - Implement SCCM for the IS Lab
  - Develop 10+ applications for deployment
  - Documentation about the whole setting up and configuration process
- Build an image for IS Lab with Windows 8.1

In summary, I strongly believe this capstone project is the best way for me to apply what I have learned from the program and to make meaningful contribution to the IS program.
Executive Summary

Introduction/Problem Statement

For many small business owners, keeping track of employees’ time is more work than it should be. Many business owners use pencil and paper only to enter it into a spreadsheet at the end of the month. With the timesheet app for iOS and Android, employees will be able to easily and accurately record the times they punch in and out and then export as a CSV file their “Timesheet” for any period requested. In addition, the app provides (or will provide) other features such as break reminders, geo-tracking, notifying the manager when employees start a shift, and more.

Proposed Solution/Approach

My system will consist of iOS and Android clients as well as a backend web service. The Android client (which was the focus for the cap stone) provides the same features as the iOS client and both use the same backend to ensure compatibility. As mentioned before these clients will aid managers and their employees in keeping track of time and sharing it easily.

High-Level Design

Punch:
This is where the user starts and ends a shift. The interface is flexible enough to consider that employees may take breaks during the day, but will want to resume the shift from where they left off. They can also do things like add notes or event titles.

History:
This allows the user to drill down into each Punch. It starts off grouped by pay periods, then shows each shift. Within each shift the user can view each punch and finally get a summary page.

Export:
After the Employee has linked with a Manager they can select a date range and export all the shifts found within that date range. By hitting SUBMIT an email draft appears with an attached .csv file and a email body explaining the purpose of the email as well as a total time calculated. All the user has to do is click send and the timecard is sent to whatever email address the Manager has chosen.

Settings:
Minimal setup is required and it takes place on the Settings page. Users fill in their name, phone number and User type (Employee or Manager). Each user is verified by having a text message sent to their phone. When the click the link in the message, their account setup is completed and they can continue using the app.

Push notifications are used to alert the user of incoming requests, and are even used to enforce manager preferences to linked employees.

The backend web service is already written in python and hosted by Google app engine. The server tracks information, including anything needed to send push notifications, in what’s called datastore. When the server needs to send a push notification, it does so through the parse.com service.
Executive Summary

Currently, most mobile games are addictive time-wasters without very much fun gameplay. The mobile app marketplaces have many games with “social” features like sending points to friends or “visiting” them, but few mobile games have actual multiplayer features that enable you to play the game with your friends concurrently. Additionally, many mobile games stop your gameplay with “energy” or timers. The mobile game market needs better games!

In 2003, I created an online video game called Rise of Heroes. For my capstone project, I have begun recreating this game in 3D for mobile platforms (iOS, Android, and Web) using Unity. The game is a fun, multiplayer action RPG game where you explore a world full of dungeons, monsters, spells, and treasure.

The game code is written in C#. I created the game’s artwork using Blender 3D and the GIMP. I also used some 3D character and animation assets from the Unity Asset Store.

You can play a WebGL demo of the game at www.xerse.net. You can also sign up at that website to be notified about Rise of Heroes news, such as when the game becomes available on the iTunes App Store and Google Play.
MISM Capstone Project
Polynesian Cultural Center iOS App

Name(s): Mark Laney, Alex Murray
Faculty Mentor: Steve Liddle

Executive Summary

Everything at the Polynesian Cultural Center is about preserving traditions. However, management is looking for new, innovative ways to enhance the customer experience and aid them in providing better marketing to their customers, while maintaining the same Polynesian experience customers expect.

Management needs help with several issues. First, customers have a hard time deciding how to spend their time, keeping track of time, and finding the location of events in the park. Second, management also wants customers to come away smarter. Customers who pay for a PCC guide receive valuable pieces of information that adds depth to the visit. Because many customers do not pay for a guide, they are looking for another way to provide the educational experience. Finally, PCC also needs help with marketing. The center is looking for some way to collect information about customers, so they can reach out to them in the future with amazing deals.

To resolve these issues, we will be building an iOS app. This app will provide a map of the park, a daily schedule, an itinerary builder, and an educational guide. The map will help users navigate, the schedule will push notifications that will help users keep track of time, the itinerary builder will suggest popular activities and events, and the guide will push educational content directly to the customer, based off their location in the park. It will also collect the data PCC needs to boost email marketing.

We will be building this app in Swift and Objective-C. In order to facilitate scalability, push-notifications, and database management, we will be using the Parse framework. Finally, we will be using iBeacon technology to handle location-based events.

The culmination of these tools will enable us to deliver exactly what PCC needs. We are confident that the proposed solution will enable PCC to enhance the customer experience and give management the information they need to improve marketing.
Executive Summary

IS 402 is the only Information Systems class that IS students have on databases. I have found that this lack of knowledge a great hindrance when looking for jobs in the business intelligence sector of IT. Through work experience, self-teaching, and mentoring, I have developed a solid base of knowledge and skills to be able to help fill the gap that is present. While I do not consider myself an expert in said fields, I do believe I can bring valuable insights and help from having just gone through the program. I teamed up with Dr. Allen to build a new ADVANCED DATABASE course. I created the data warehouse, ETL, and Visualization lectures with associated labs and other materials. I believe this course addition will be a great add to the quiver of IS students abilities.

The problem comes from a lack of knowledge that I felt when entering the workforce in Business Intelligence. This lack of knowledge all revolved around not knowing SQL well enough and not understanding databases enough to effectively perform my job/internship. There is a missing piece to our course catalog between the beginner IS 402 class which teaches basic principles and IS 555 (Data Mining) which teaches how to analyze the data. This gap between the courses is comprised of how to take a transactional database into a data warehouse, how to load the data from the database to the data warehouse, and how to visual represent what data is in the data warehouse. All of these things need to happen before you can effectively mine the data. With this missing knowledge I feel like BYU IS students who seek a career in Business Intelligence are not strong candidates in the workforce.

I was able to design from the ground up three distinct course lectures, with the associated slides and labs. Through Microsoft Sql Server, Visual Studios, and Tableau, I have created an environment where students can learn hands on, how to accomplish the task of designing, building, loading, and visually representing a data warehouse. This experience should give the students an in-depth look at how the Business Intelligence world works and give them a taste of how different jobs in the BI world look like. When they complete this course, they will have a good foundation that they can build on in the work force.
Executive Summary

The gaming industry is a fast-growing and largely profitable industry. According to online sources, analysts predict the global video game industry will reach $91 billion in 2015*. With such large revenues, and given the past history of the industry, it is clear that video games are not going away anytime soon. It can also be seen that from such games as Flappy Birds, huge profits can be made with a simple idea.

The question remains whether these video games provide any value to society or if they are just a waste of time that people get addicted to, like cigarettes. My project is not to answer that question, but rather to place myself in a position where I might be able to eventually make a positive influence. I want to learn how to design and develop video games that I might achieve at least one of two objectives: (1) Make money off the popularity of video games and/or (2) Make quality games that can be of some benefit to society other than mere entertainment.

I decided to use Unity as my game development platform to build a 3D adventure game. The purpose of the game is to survive and make your character stronger by attacking creatures in this world with either a sword or a bow and arrow. Since this is my first attempt at game development, I decided against implementing story and character development. Instead I focused my learning on the development of game mechanics.

Unity has a UI-rich development environment with the ability to create custom a C#/JavaScript backend for the game. Part of the project was to learn and master the development environment of Unity. On top of mastering the Unity game engine I needed to delve into 3D modeling and animation to complete the game. Blender, a free, robust, 3D modeling tool was selected for this project.
MISM Capstone Project
Project Management Software ("Procademy")

Name(s): Sean Fisher, Sean Thornton, Morgan Young
Faculty Mentor: Dr. Greg Anderson

Capstone Introduction
Ernie Nielsen is a world-renowned project manager who developed a project management process model that every successful project, whether it realizes it or not, follows from inception to completion. This last school year Morgan approached Ernie to ask a simple question. "Why hasn't anybody made any software for this yet?" The response was just that nobody had taken it on yet.

For this capstone, we created a web application that walks a person through the steps to properly organize and begin a project. The system will not directly compete with tools such as Microsoft Project, but provides a broader approach to project management, focusing on guiding the user through a well-defined, repeatable process. The process has been proven to work for projects large and small with varying rigor.

Problems to Solve
While there are many pieces of software that purport to aid with project management (i.e. Microsoft Project), and many tools that help to manage a running Agile project with Kanban or Scrum methodologies, there is no tool that satisfactorily walks a project manager, or a small business owner, or a budding entrepreneur who just hired his first employee, through the process of getting a project off the ground and ready to run.

Solution
Procademy is a web application that walks a project manager through proven practices to ensure that a project succeeds. It is similar to that of popular do-it-yourself tax preparation software. Procademy contains excerpts from Ernie's Project Management Process Guide to help the novice project manager succeed. Furthermore, Procademy keeps track of and assigns stakeholders to the members of a project manager's project team. Finally, Procademy collects the information needed to integrate with Microsoft Project, a standard tool in project management and Google Drive for easy documentation management.

Major Components
- Web Application
- Microsoft Project Integration
- Ernie's Project Management Process Guide Integration
- Google Drive Integration

Technologies
- C# with ASP.NET and MVC5
- Cloud services from Arvixe
- MS SQL 2012
MISM Capstone Project
Project Narrative: Approaching Narrative Therapy Through Social Media

Name(s): Brian Farnsworth, Matthew Sheets
Faculty Mentor: Dr. Stephen P. Liddle

Executive Summary

Project Description
Project Narrative attempts to create a social media platform geared towards the niche market of personal storytelling. Sierra and Cameron Baird have worked for several years to create projectnarrative.com\(^1\), but have dreamed of creating a dynamic, far-reaching platform to enable a greater group of individuals to tell their stories. Our project attempts to meet that need.

Problem
In an ever increasingly busy world, and even as technological luxuries and solutions race month by month to replace and meet the problems and opportunities around us, individuals seem to be losing themselves rather than finding resolution and contentment in their daily lives. In the sphere of personal counseling, Narrative Therapy attempts to create a method for helping individuals externalize and thereby better cope with the complex issues that they face in life\(^2\). Though there is no desire to attempt to couch Project Narrative as an app intended for therapy, the hope is that through sharing and expressing a diverse set of stories and experiences through the platform, individuals may be able to better understand and externalize the things they experience, especially those for whom therapy may be too costly to pursue.

Solution
We have worked together to create an iPhone app using the Swift language as a client application for recording, uploading, browsing, and listening to personal narratives in order to partially or completely replace projectnarrative.com as the repository and hub for Project Narrative. The current website requires that Sierra or Cameron receive narratives via email which they then manually upload. Using the iOS SDK for recording and then Microsoft Azure for cloud storage, mobile authentication, and media services, we’ve integrated the ability to quickly upload, encode and publish recorded narratives which can then be streamed via progressive download to a client application.

Further Work
The most obvious next steps for the project will be

- Recreating the Project Narrative website for easy online browsing of published narratives and increased awareness;
- Publishing our iOS app to the App Store
- Investigating further development for Android and Windows native clients

\(^1\) Visit [http://projectnarrative.com](http://projectnarrative.com) to see the impressive work that Cameron and Sierra—both non-developers in occupational expertise—have put together as they have pursued this project.

\(^2\) See [http://en.wikipedia.org/wiki/Narrative_therapy#Concept](http://en.wikipedia.org/wiki/Narrative_therapy#Concept) for a more in-depth explanation of Narrative Therapy.
Executive Summary

Gamers and parents of young gamers who are concerned about the amount of foul language we are exposed to on a daily basis will agree that such language does not belong in the home. But too often video games will loosely use profanity within an engaging story, resulting in the gamer feeling uncomfortable, either for him/herself or for those within earshot.

Video game developers are not going to remove these offensive words, so I would like to create a method of filtering basic profanity from video game consoles based on the ideas behind such devices as ClearPlay and TVGuardian. This would require intercepting the audio signal before it reaches the speakers, flagging the offensive language, and removing the audio sample with the offending word. Due to gaming lag tolerance, this process cannot delay the signal for more than 60ms.

The main scope of this project is to **prove the concept of filtering real-time voice for video game consoles**. Because of the time constraint, a library of known offensive word locations will need to be created and sorted by game for access in real time.

In order to flag targeted words, speech recognition models will be used. Since the focus is in-game language, audio samples can be collected from game files off the storage device. These samples will be convert and used to train a model to identify the words or phases preceding the targeted word in real time. By using a model trained on the specific phrases, a program can be executed to replace the audio with either blank audio or replacement audio at the appropriate time (e.g. “shoot” in place of “s\*\*\*t”).

Recognizing that this project is very complex, with many unknown factors, it has been difficult to successfully find a method of training speech recognition models with this specific task. However, as stated above, the purpose of this project is to prove the concept. The experience of collecting and analyzing data, training speech recognition models, storing desired results, and modifying audio in real time has been an accomplishment in and of itself. The process will be difficult to scale and implement given the variations in video game file types, but concept is feasible given more invested time and proper knowledge of speech processing. At the very least, I hope to raise awareness for the small population of gamers that does not appreciate foul language.
Executive Summary

Introduction of the Problem

Brainstorming is a difficult process to do well. Entire fields exist to study ways to improve the quality of group communication. Several keys to effective brainstorming and ideation (forming ideas) in a group setting are (a) anonymity and (b) frictionless recording. Specifically, (a) being singled out for alternative ideas or (b) unnecessarily waiting for your ideas to be recorded causes censoring (whether by oneself or the group) which is detrimental to the creative process.

Solution Proposal

TeamStorm is a Real-time Brainstorming system that allows small teams to create “activities” on certain topics and anonymously post messages to those activities. Activities can be created from pre-defined templates in formats such as “Pro-Con” and “SWOT” which utilize 2-column and 4x4 Boards of “categorized” messages. Custom categories of messages can also be defined. A generic message list format is also available for messages without categories.

Components and Technologies

TeamStorm uses a Node.js API service, a React + Flux Single-Page Web Application, NOSQL database RethinkDB. With this architecture, TeamStorm delivers a robust, scalable, real-time brainstorming

The client subscribes to Server Sent Events on the API server. Once the API server accepts the subscription, it queries the database and registers as a listener to a Change Feed. Whenever new messages get saved to the Database, it notifies the registered API listener, which in turn notifies the subscribed Browser. This process happens without main thread, meaning the API Server and Database can serve many simultaneous requests.

The TeamStorm source code is hosted on Github. The application is deployed on Heroku and the RethinkDB database is deployed to DigitalOcean. The main subsystems are as follows:

1) **Distributed Brainstorming** with real-time, anonymous updates to promote collaborative ideation for short bursts.
2) **OAuth2 Sign-On** using popular providers such as Facebook and Google.
3) **Ad-hoc Team Formation** with a auto-completing fuzzy search for users to add as members and to only share Activities with specific teams.
4) **Continuous Integration/ Deployment Pipeline** using Codeship to automatically pull code updates from Github, build the app, run tests, and deploy successful builds to Heroku.
MISM Capstone Project
Smash Vid

Name(s): Ryan Craig
Faculty Mentor: Dr. Steve Liddle

Executive Summary

SmashVid is a new way to communicate with friends and family. It enables individuals to collaboratively create videos and share their creations in a new and interesting way.

The process begins when a user creates a new video and chooses Facebook friends to “smash” with. These friends then see the new smash on their home feed in the app and can check out the smash to collaborate if it isn't currently locked. These friends then have the ability to check out the video and edit it in interesting ways. The user may:

- Record additional content to the beginning, middle, or end of the existing video
- Replace the original audio through recording new audio
- Erase portions of the original video
- Type messages on the video

During the process all of the users may see the progression of the smash, which remains on their feed indefinitely or until deleted by the author.

SmashVid utilizes Xamarin Studio for mobile development, Windows Azure Mobile Services for data sync, and Facebook authentication for its social platform.

Xamarin enables developers to write code for each platform (Android, iOS, and Windows Phone) in C#, yet allows developers to compile to each platform natively. Windows Azure Mobile Services provides an advanced data storage medium, providing for execution of Node.js statements while storing code in Microsoft SQL Server. This enables custom create, read, update, and delete scripts as well as custom APIs. Facebook provides a convenient way to personalized the app, bringing in the user’s profile picture and built-in network of friends to invite to a Smash.
Executive Summary

Kyazma is a growing business consulting firm in the Utah Valley area that focuses on implementation and customization of the Salesforce customer relationship management platform. As a firm, a major pain point Kyazma is trying to address is its inability to share information. Kyazma essentially sells knowledge and expertise. Collectively, its consultants have been able to obtain vast amounts of knowledge, but that knowledge is lost when someone leaves the company or is moved off a project, and is often not accessible because there is a bottleneck at the senior developer and senior consultant level. For our capstone project we have built a knowledge repository to help manage this problem.

The Knowledge Repository is a web based collaboration tool. The potential scope of this project is huge. When working with Kyazma's internal stakeholder, we were able to narrow it down to 3 major problems we would address in our first iteration. In order of importance they are the sharing of code, the sharing of knowledge, and the sharing of documentation.

First, the customization and implementation of Salesforce often requires custom code that must be implemented by Kyazma's developers. Developers frequently reuse portions of code in this process to accomplish similar tasks that they have handled in the past. These code snippets need to be shared and utilized by all developers. Second, because of the incredible breadth of the Salesforce platform, there are endless tips, tricks, shortcuts and strange caveats discovered that reside at the senior developer and senior consultant level. This information needs to trickle down and be shared with junior level employees and new hires. Third, Kyazma really wanted a place to house documentation, both current and historical. Employees and management need to be able to reference past projects and quickly be able to come up to speed on what work has been done.

The Knowledge Repository will serve as a central repository where the above solutions can be recorded and shared. Employees can create articles with a title and introduction. The article can then have as many different sections as needed, each having a title and the body of the content. This can all be used to provide descriptive instructions for common problems. The most beneficial part is the ability to create and save snippets of code to a central repository for all to access. There is browse and search functionality as well to make it easier to find what articles and code are needed.

All code snippets created in our website are saved to a company GitHub account using the GitHub Gists API. This will allow us to keep track of the history of a snippet of code as it goes through changes. We are fortunate enough to be able to stay with Kyazma as employees beyond the scope of this capstone project. This will allow us to continue help to encourage user adoption and improve The Knowledge Repository in future iterations.
MISM Capstone Project
BYU IS News

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**Executive Summary**

**Introduction**
The vision of this project is to create a single resource for alumni of the BYU information systems program that allows them to keep informed on both the department's and alumni's accomplishments and changes.

**The Problem**
Students, faculty, and alumni of the IS department are involved in impressive projects and developments. Once students graduate from the program, they do not have a single source of information to keep up-to-date with the department. Rather, they have to check multiple online and offline sources including the Marriott School alumni magazine, the IS Twitter feed, the department Facebook page, BYU articles, and any number of unaffiliated news feeds.

Furthermore, opportunities for alumni to give back to the program have historically been ambiguously defined and difficult to find. If alumni want to donate funds, mentorship, or service, they struggle to know how to do so or who to contact to find out. The department has been searching for a one-stop-shop to offer alumni and is hoping to keep closer tabs on alumni throughout their careers.

**The Solution**
The new BYU IS News website addresses these problems by providing a one-stop-shop for alumni to find updates on the program, to give back, and to update the department.

The site features an introduction to the program, advisory board, and a department message, for those who would like an overview of the program’s current status. Students, faculty, and alumni can submit an article to feature themselves or their colleagues who are making a difference in the world. Additionally, each page shows links to relevant news and articles across the web, providing alumni with a single place to find the updates on the program, faculty, students, and other alumni.

A page dedicated to giving back provides alumni a list of their opportunities to donate time, money, service, or other resources to the program. It also features donors’ testimonials of what giving back has meant for them, making it easy for alumni to see how others are finding meaning through their contributions.

IS alumni can easily submit their own updates as they continue in their careers, so their peers can keep up with their accomplishments. The website content can be easily shared on social media sites, so alumni can let their peers know what IS graduates are doing.

**The Technology**
The site is hosted in the IS lab on a server Dr. Tom Meservy granted the department on which we installed Joomla. We took into consideration the future of the site and chose this technology, which permits easy site maintenance for people with varying technical prowess.
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At its core, FillStat is an app that allows users to create a log entry each time they fill up for gas to track their miles per gallon. While a half-dozen or so apps for this purpose are available on the Android App store, FillStat creates a new space in terms of feature set and ease of use. When a user fills up for gas, FillStat uses GPS to find and record the gas station automatically. The user can enter price, gallons, and odometer manually through optimized text fields or take advantage of the app’s custom voice input capability. Users can create multiple vehicles and share them with other users. All data is synced in the cloud and optionally with multiple devices. One of the best practical uses of FillStat is finding which gas brands give your vehicle the best mileage.

PumpPal was the original app created for this project. It allows users to find the cheapest gas nearby and submit price updates. An early version of PumpPal was released on the Google Play store and was awarded sixth place in the BYU Mobile App competition. Because of high barriers to entry in this market dominated by GasBuddy, I pivoted to the FillStat app described above.

Problem Background

Many drivers use receipts or a notebook to track their mileage. These solutions often require pulling out a hand calculator and they don’t facilitate easy consumption of the data recorded. Several apps are available but entering the data into these is arguably harder than using pencil and paper. Existing apps allow for only one user on one device. This is a problem when users buy new phones and when more than one person may fill a car’s tank. When I need to fill up my tank, apps like GasBuddy or PumpPal can tell me where to find the cheapest gas, but there’s no app that tells me which gas will give me the best mileage.

Solution

FillStat Features

- Automatically calculate MPG
- Automatically record gas station, date, and time
- Easy numeric entry
- Voice recognition
- Supports multiple devices
- Multiple vehicles
- Share vehicles
- Show MPG by gas station
- Material Design

Technology and Specifics

FillStat is a native Android app that supports 4.1.3 JellyBean to the latest 5.0 Lollipop. It incorporates a half dozen open-source libraries. Cloud integration is accomplished via Parse, an app backend service with a NoSQL database at its core. Vehicle sharing is made possible by appropriately designing the access control lists in the database. Material design gives the app a modern look. Numeric entry is processed to ensure data is entered in the correct format. When a user creates a new entry, the location service is called to get GPS coordinates. These coordinates are used to find the nearest gas station via rest interface with myGasFeed.com. Robust voice input capability allows users to create a log entry by speaking as little as one sentence using near-natural English. This is accomplished by using regular expressions and a custom processing map to convert text from Android’s SpeechRecognizer to program events and field entries.
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BlenderBottle Company has a worldwide reach and thousands of customers. While many of those customers are large corporations with well-known faces and regular ordering schedules, there are exponentially more customers who represent small mom-and-pop shops with little inventory and no regular ordering schedules. In the face of such a large number of relationships to maintain, it can be especially easy for smaller customers lacking regular order schedules to fall through the cracks among the company sales reps.

In order to prevent this fallout, and to help sales reps better maintain relationships with all of their customers, we have been working on a business intelligence software solution that mines through customer transactions daily and runs the transaction details through an algorithm to identify which customers are well past their due order date as well as what they are likely to order. This system would fulfill the following business purposes:

- View a list of customers arranged by when they’ll likely need to order next
- View useful customer details such as transaction history, trends, and similar customer groups
- Automatically draft an email template pre-filled with a customer’s information and probable order specifications when the time has been calculated that the customer will want to order
- Allow editing of said email templates and the ability to send them straight from the system interface

This application that we are designing will accomplish the above mentioned purposes by (1) nightly retrieving customer transaction data from the ERP database, (2) calculating average order intervals for each customer, (3) using Multiple Regression modeling to predict which products customers will likely want to order. If we find that there is a statistical backing to it, we may also design the system to make recommendations based on what similar customer groups have bought.

Due to the sensitive nature of the data used in this application, it will be deployed on an in-house server and administered under tight security protocols. We anticipate that this application will help company sales reps catch hundreds of customers from falling between the cracks. Consequently, we expect to see a noticeable boost in customer relations and increase in revenue for both the sales reps and the company as a whole.
Executive Summary

CyberIQ is an initiative to teach teens about security; it is an initiative to educate teens on how to stay safe online. Teens are the future of our world. They will be taking over and with the increased availability of technology in their hands, it is key to their success that they learn techniques to protect their information, their resources, and their capabilities from threats posed by the Internet and other technologies. In today’s world it is clear that we are not moving away from technology and since teens have access to it at earlier ages, we created CyberIQ.

CyberIQ is more than an initiative that aims to educate teens; it is also a centralized set of resources that together provide teens with possible ways to increase their online safety. CyberIQ’s resources can all be accessed on the website www.cyberiq.org with any device. CyberIQ’s website implements Responsive Web Design precisely to provide teens with resources at all times even through their mobile devices as they complete their day to day activities. These resources are listed as follows:

- **Tutorials:** step by step processes that guide teens to secure their devices
- **Scenarios:** real life stories of security breaches that teens can relate to
- **Info graphics:** funny videos that briefly explain each topic
- **Videos:** actors that introduce CyberIQ’s YouTube channel
- **Toolkits:** tools and instructions to make devices more safe
- **Blog:** current issues and news that teens need to be aware of

The topics covered in CyberIQ’s website are divided into four different categories: data protection, Internet security, mobile security, and social engineering. Some of the topics under these categories are: malware and viruses, encryption, passwords, user accounts, public computers, public wifi, sharing information, sexting, QR codes, phishing, scams, and spam, among others. The website has graphics and scenarios that target teenagers so that they find learning about these topics more appealing.

As part of CyberIQ’s purpose, it aims to extend and expand its initiative to all the high schools in the US, as well as globally to other countries. Currently CyberIQ has reached recognition in Provo School Districts as we visited most of them to teach teens about some of the topics offered in the website per request of the school’s principal or professors. The lessons consisted of 1 to 2 hour periods of constant interaction with teens answering questions, sharing real life experiences, showing them the info graphics we put together taking into account their thoughts and ideas that came from focus groups with teens, as well as teaching them new concepts and technologies.

In order to extend CyberIQ to other schools in the US we attended a career fair at BYU with representatives and principals of all school districts in the US and distributed flyers promoting CyberIQ’s website and its resources. We still keep in touch with these school that have emailed us about using our resources from the website for their technology classes to guide students in their learning of online safety. In order to extend CyberIQ globally, we contacted high schools in Colombia to promote the website and resources. These schools also used the materials available on the website in technology classes to contribute to CyberIQ’s efforts to teach teens as well. In addition, we presented about CyberIQ to different news channels, including Fox13, KSL, and KUTV to create awareness not only for teens but also to parents and educators.

In addition, we had the opportunity to show CyberIQ to parents and educators in the Women in Cyber Security Conference held in Atlanta, GA. In this conference we had the opportunity to present our project by submitting a poster with the main ideas of our initiative. Networking in this event allowed us to get the word out, which is a stepping stone to keep spreading CyberIQ around the world until it reaches its end goal: be the go-to resource for teens when they have questions about security and appropriate online habits.